Web Browser Access for a Client-Server Obstetrical Ultrasound Database

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The Maternal-Fetal Medicine Division of the Department of Obstetrics and Gynecology performs over 10,000 obstetric ultrasound examinations each year in two ultrasound laboratories, two labor and delivery units, two emergency rooms, an urgent care center and in a mobile unit that serves a number of neighborhood clinics. For the past seven years we have employed a client-server database developed in 4th Dimension® (ACI US, Inc.) to manage generation, reporting, and storage of ultrasound reports as well as associated scheduling and physician letter preparation functions. As each report is accepted into the database, an HL7-formatted text document containing the observations and calculations is created. Periodically throughout the work day these documents are transferred by FTP to the central patient database (Regenstrief Automated Medical Records System) for inclusion in the patient's longitudinal record. We have found that the most efficient and reliable method of data accumulation is to have the physician or technician who performs the examination record observations and measurements on a paper form which is then faxed or brought to a single site for computer entry by data input clerks.

Two situations are not addressed by this procedure, however. Complete reports cannot generally be generated at night or on weekends, and busy residents or faculty working in the emergency room or labor area frequently perform examinations without completing the paperwork necessary to capture the examination into the computer record. Direct access to the ultrasound database at these sites would be ideal but has heretofore been prohibited by hardware and software incompatibilities. Recently we addressed this problem by creating a Macintosh web server using WebSTAR (StarNine Technologies, Inc.) which communicates with the 4th Dimension ultrasound database by means of NetLink/4D™ (Foresight Technology, Inc). Only selected IP addresses may access the server and access to the database is limited by password. Data entry is performed at labor and delivery sites by using Netscape browsers. JavaScript is employed for data entry filtering. The user can request that the database server send a detailed report to a local fax. Utilization of a database rather than spreadsheet to perform these functions enables recall of previous data for such comparative functions as plotting fetal growth trends. Preliminary user response has been very encouraging. We are in the process of evaluating how well this approach decreases report generation time and the extent to which it improves the thoroughness of capture of examinations.

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